

THE IMMATURE STAGES OF *PSYLLOBORA GRATIOSA* MADER, 1958 (COLEOPTERA: COCCINELLIDAE) WITH SOME BIOLOGICAL ASPECTS¹

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Abstract.—Eggs, larval instars and pupae of *Psyllobora gratiosa* Mader, 1958 are described and illustrated using scanning electron micrographs. Some notes about the life habits are also provided.

Psyllobora gratiosa is a South American representative of the cosmopolitan genus *Psyllobora* Chevrolat. With a few exceptions the immature stages of this genus have been ignored in taxonomic treatments.

Davidson (1921) described all stages of *P. taedata* LeConte and made some experiments with rose mildew and animal foods concluding that aphid and red spiders were refused by larvae and adults. Members of *Psylloborini* are known to feed on fungus, particularly the mildew type. According to Gordon (1985), mites and aphids have been recorded as hosts in the literature, but these data are probably a result of inaccurate observation.

Rees *et al.* (1994) presented an illustrated key to larvae of 46 of the 60 North American Coccinellidae including *Psyllobora*, represented by *P. vigintimaculata* (Say), and a glossary of terms modified from Gage (1920).

In this paper, eggs, larval instars and pupae are described using scanning electron micrographs prepared by the Centro de Microscopia Eletronica-Universidade Federal do Paraná.

The adults were kept in round plastic containers (0.9 cm diameter) with a piece of humidity filter paper and leaves of *Hydrangea hortensis* Sér. infested with *Oidium* sp. The eggs, larvae and pupae were preserved in Kahle-Dietrich solution for the drawing illustration.

IMMATURE STAGES

Description. *Egg.* Color pale translucent, oval, elongate, with no visible sculpturing (Fig. 15), with the base flat where it contacts the leaf surface, 0.75 mm long, 0.33–0.42 mm wide.

Larva. First, second and third instars: First, second and third instars are similar in shape, body slightly soft and the color of the first instar is translucent (Fig. 16), second and third instars are same as fourth instar. Setae of strumae are proportionally more slender and smaller.

First instar—body length 1.08–1.25 mm; widest diameter 0.42–0.67 mm.

Second instar—body length 1.92–2.42 mm; widest diameter 0.67–0.92 mm.

Third instar—body length 3.00–3.17 mm; widest diameter 0.92–1.00 mm.

Fourth instar: Length 3.67–4.67 mm; width 0.92–1.00 mm. Body elongate, usu-

ally widest on second or third thoracic segment, narrowed more posteriorly than towards head; moderately flattened on dorsal and ventral surfaces. Usually white grey spots on tergal plates, and two yellow lateral spots on the first abdominal segment (Fig. 1). Strumae of dorsal and lateral surfaces with each seta divided at apex (Fig. 4).

Head small, usually subrounded, slightly wider than long (Fig. 5). Epicranial suture slightly Y shaped; three well developed lateral ocelli. Antenna (Fig. 7) three segmented, first segment transverse, second slightly longer than wider with two thin setae, third segment small, rather indistinct, with a number of very short conical sensilla at apex (Fig. 8). Labrum rectangular or subsquare; mandible robust, with five teeth, serially arranged; retinaculum with two teeth and a strong mola (Fig. 3). Maxilla with a rudimentary galea; maxillary palpus with three segments, first and second with setae and third with small papillae (Fig. 6). Labium with prementum and postmentum fused together, with small palpus and apical sensory papillae. Four pair of strong setae between the maxillae and labium, many thin and smaller ones setae in middle of prementum (Fig. 6).

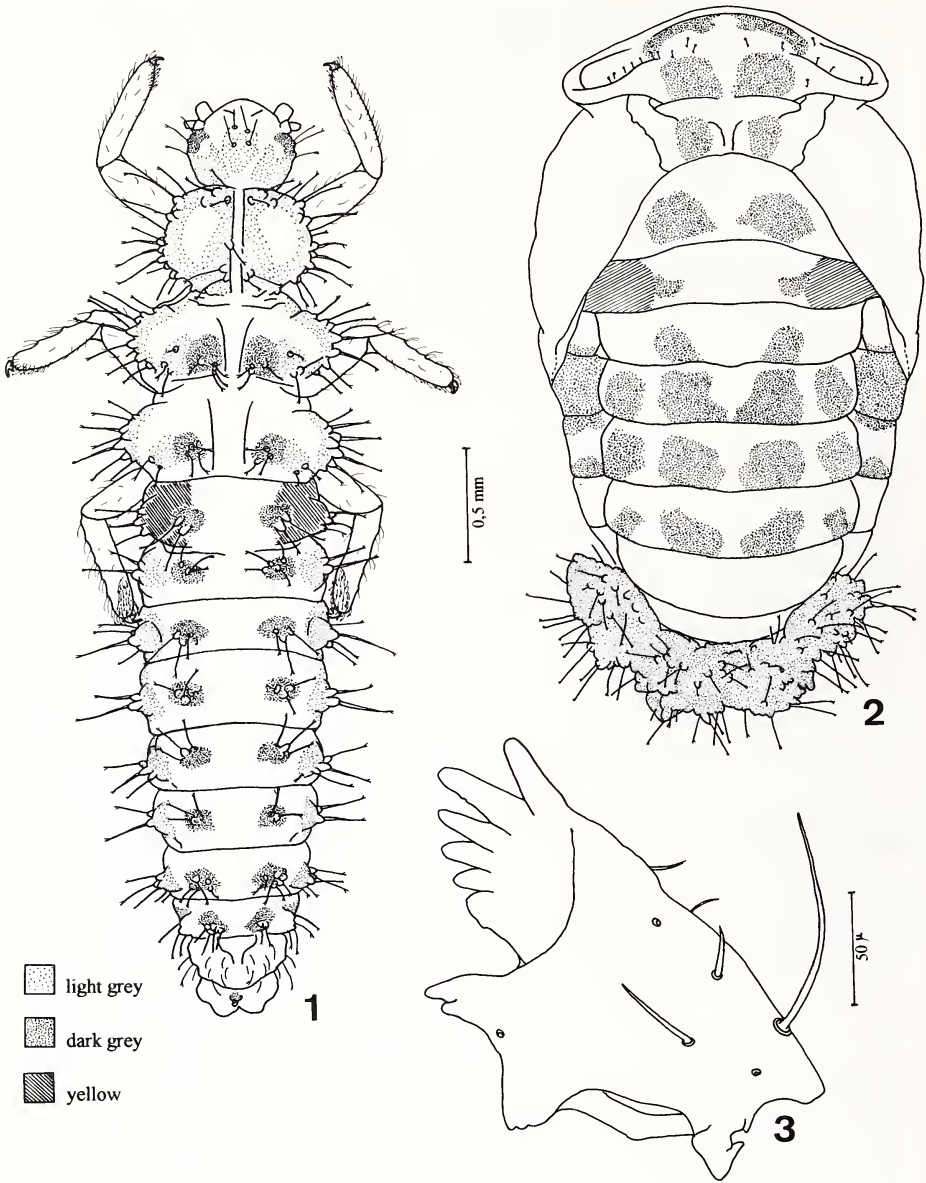
Pronotum strongly sclerotized, with two well developed plates with setae of various sizes distributed along anterior, lateral and posterior margins, disk concave, with longitudinal white band and lateral margins with chalazae. Meso and metanotum with two developed plates each with one central sclerotized struma and some chalazae together. Legs similar in structure on all segments, with small, sparse setae, except on inner side of tibiae where setae are dense, long and thickened at apices. Claw with triangular basal tooth, bent moderately to strongly pointed distally (Fig. 9).

Abdomen 10-segmented, not sclerotized; first eight segments each with pair of spiracles on dorsal surface and two pairs of strumae, one on dorsal and one on lateral surface (Fig. 10). The dorsal strumae are dark grey, lateral are light grey, each with five to seven chalazae (Fig. 1). First abdominal segment with two yellow lateral spots with strumae possessing black setae (Figs. 1, 17). Each pleural segment with a light strumae (Fig. 1). Ventral surface with four small strumae on each segment, with white setae without divided apices (Fig. 12). Between the chalazae of strumae there are groups of three to five short spines (Fig. 13).

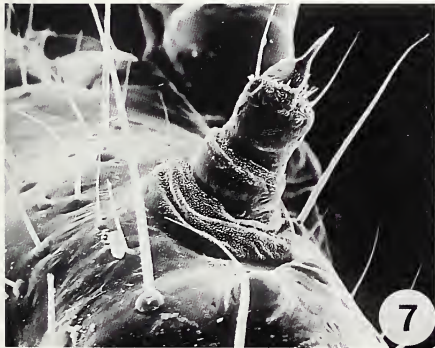
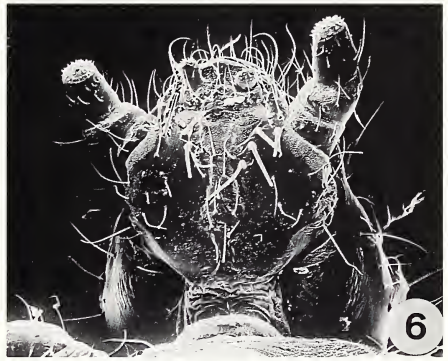
Pupa. Length 2.42–2.83 mm; width 1.50–1.67 mm. Whitish grey with dark brown spots on the thorax and abdomen (Figs. 2, 19). Head strongly deflexed, not visible from above. Pronotum sinuated laterally, distinctly arched and notched. Wing pad bare, extending to third abdominal segment. Pronotum with four spots, meso and metanotum transverses with two spots each. First abdominal tergum with two small brown spots in middle and two large lateral yellow spots; second tergum with two brown spots; third, fourth and fifth terga with four brown spots each. Third and fourth pleural segments with one or two brown spots.

DISCUSSION

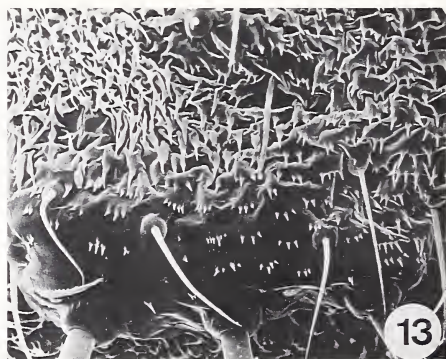
The mandible of *P. gratiosa* is very typical, with five teeth serially arranged. This kind of mandible is similar to other species that feed on fungi. The evident retinaculum with two teeth differs from the phytophagous species *Epilachna borealis* (Fabricius, 1775) referred by Rees *et al.* (1994), and also from *E. cacica* and *E. spreta*,



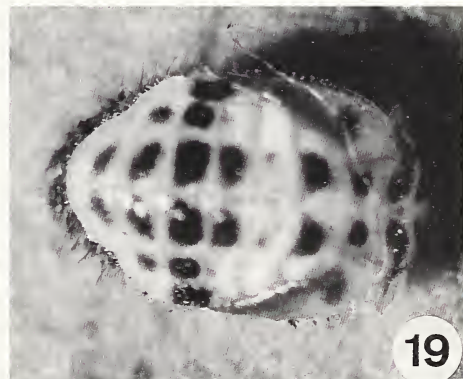
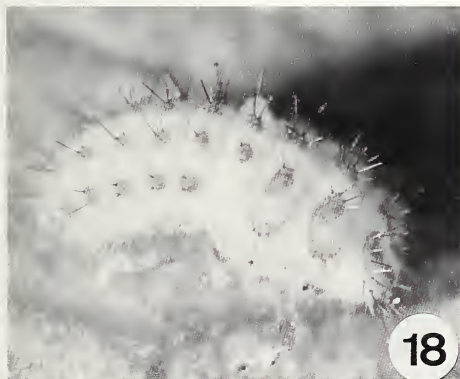
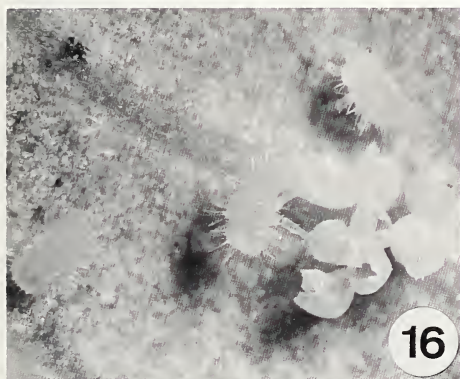
Figs. 1-3. *Psyllobora gratiosa*. 1. larva fourth instar (dorsal view); 2. pupa (dorsal view); 3. mandible.



Figs. 4–8. *Psyllobora gratiosa*. 4. setae of abdomen; 5. head (dorsal view); 6. head (ventral view); 7. antenna; 8. conical sensillae at apex of antenna.



Figs. 9–13. *Psyllobora gratiosa*. 9. claw; Abdomen: 10. lateral surface, 11. dorsal strumae, 12. ventral strumae, 13. integument spines (ventral).



Figs. 14–19. *Psyllobora gratiosa*. 14 adults; 15. eggs; 16. first larval instar; 17. fourth larval instar; 18. prepupa; 19. pupa.

two other South American species of this genus, which lack a retinaculum or mola (Almeida & Ribeiro, 1986 and Ribeiro & Almeida, 1989).

The strumae on dorsal and lateral surfaces of body differ from *Halyzia* and *P. vigintimaculata* because in *P. gratiosa* the setae are divided at the apex. This structure is unlike that of any previously studied species.

BIOLOGICAL DATA

Adults of *P. gratiosa* were collected in March of 1997 at Curitiba, Paraná, feeding on *Oidium* sp. from *Hydrangea hortensis* Sér., a very common plant in southern Brazil (Fig. 14). Eggs were attached to the surface of the leaves in small groups of 5 to 9 (Fig. 15), and all were fertile. The first larval instar was translucent (Fig. 16) and moved fairly fast to feed. The larvae (Fig. 17) fed using the five teeth of the mandible (Fig. 3) to grasp the fungus. Pupation occurred after the fourth instar became pale and inflated (Fig. 18) and took place on the inferior surface of the leaf (Fig. 19).

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